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By

G. Carleton Ray, Douglas Wartzok, and others

(See abstracts)

Rodney V. Salm, James A. Dobbin
John C. Beier

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Second Conference on the Biology
of Marine Mammals, San Diego,
CA, 12-15 Dec. 1977, p. 22

ECOLOGY

SECTION 1

INSIGHTS INTO THE NATURAL HISTORY OF THE PACIFIC WALRUS. G. Carleton Ray* and Douglas Wartzok, The Johns Hopkins University, Baltimore, Md. 21205.

A team from Johns Hopkins conducted integrated behavioral and ecological studies of walrus during 10-31 July Chukchi Sea cruise of the icebreaker USCGC Glacier. We remained with one "focal" group (1000-2000 animals) continuously for 12 days.

Repeated counts and observation of group movements elucidated a pattern of dispersal and reassociation in accordance with both sea ice configuration and walrus behavior. The group moved in a NE direction with the sea ice "front." Wind stress is the major driving force for sea ice movement. Thus an analysis of wind stress patterns is a prerequisite for understanding walrus habitat dynamics.

Ship position data and walrus dispersal patterns allow a calculation of 500 nmi² for the benthic feeding areas utilized by our group. This allows a preliminary model for the impact of this group in terms of its food supply. We observed several cases of polar bear predatory interactions, including kills, and estimate predation by polar bears to be important in the population dynamics of walrus, possibly accounting for a significant portion of young-of-year mortality.

Integrated, synoptic and site-specific studies of behavioral and ecological relationships, can provide process-related data on impact of walrus in their habitat and the possible perturbations of man. Such studies are necessary not only for management of walrus, but for other sea ice-inhabiting marine mammals as well.

AN APPROACH TO ANALYSIS OF CRITICAL HABITAT OF THE PACIFIC WALRUS, ODOBENUS ROSMARUS DIVERGENS. Rodney V. Salm,⁽¹⁾ G. Carleton Ray^{(1)*} and James A. Dobbin.⁽²⁾ (1) The Johns Hopkins University, Baltimore, Md. 21205; (2) James Dobbin Associates, Toronto, Ontario, M6R 1Z8, Canada.

Walrus management exemplifies dynamic complexity: critical breeding, pupping and feeding habitat boundaries change with season and between years; ranges of the sexes are partially seasonally and spatially separated; the bulk of the population has summer-winter ranges within 2 distinct jurisdictions (U.S. & USSR); and management involves great socio-economic problems.

Overlay mapping techniques are presented and defended as a tool for the collation of ecological and socio-economic parameters into functional units, and the consequent formulation of a management program. Individual thematic maps depict legal jurisdictions, present and historic walrus distributions, locations of food organisms, bathymetry, seasonal ice distribution, currents, system processes such as nutrient inputs, exploitation sites such as fishery grounds and Eskimo villages, and proposed development or protection areas. These are selectively combined to form composite maps highlighting priority research or management areas (including walrus critical habitat) and illustrating present and potential walrus-human conflicts. This approach also presents a model for conservation problem-solving for other marine mammals.

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Second Conference on the Biology of Marine Mammals, San Diego, CA,
12-15 December, 1977, page 26.

BEHAVIOR

SECTION 1

MATING BEHAVIOR OF CAPTIVE SPOTTED SEALS (PHOCA LARGHA). John C. Beier* and Douglas Wartzok, The Johns Hopkins University, Baltimore, Md. 21205.

We observed underwater mating behavior of a pair of spotted seals during April and early May in each of five years, 1973-1977. Pre- and post-copulatory behaviors and vocalizations are drawn from the repertoire which we observed throughout the year. We monitored seven types of behavioral interactions bi-weekly for a one-year period. The rate of occurrence of these interactions increases significantly at least five days prior to copulation and progressively increases up to the day of attempted mating. The rate of occurrence of six vocalization types also increases significantly during mating season. Analysis of a total of 101 mating attempts in 1976 and 1977 indicates there are several behavioral pathways leading to mating.

Second Conference on the Biology of Marine Mammals, page 80.

HUSBANDRY - PATHOLOGY - STRANDING

SECTION II

NECROPSY FINDINGS IN A BEARDED SEAL, ERIGNATHUS BARBATUS. Lynn Bishop* and Douglas Wartzok, The Johns Hopkins University, Baltimore, Md. 21205.

We obtained an adult male bearded seal, partially eaten by a polar bear, from sea ice during a cruise of the USCGC Glacier in the Chukchi Sea in July, 1977. The thoracic and abdominal cavities and brain were essentially intact.

Most significant lesions resulted from parasite infestation. Varying degrees of hyperplasia and fibrosis of bile ductules throughout the liver suggest reaction to injury by flukes although we saw no parasites. Numerous fibrotic nodules in the pancreas contained areas of ductular hyperplasia, acinar atrophy, chronic inflammation and nests of trematode eggs; we found no adult flukes. Both trematodes and cestodes were present in the lumen and attached to the mucosa of the small intestine. Multiple foci of chronic ulcerative gastritis in the forestomach were sometimes associated with clusters of nematodes attached to the mucosa. Cysts of Sarcocystis sp. were present in skeletal muscle fibers. Parasite identification is in progress.

Other findings included pulmonary and aortic arteriosclerosis, nodular adrenal cortical hyperplasia and aspermatogenesis.

Second Conf. on Biology of Marine
Mammals, San Diego, CA, 12-15 Dec.
1977, p. 68.

AGONISTIC BEHAVIOR OF WALRUS IN THE CHUKCHI SEA IN SUMMER. Douglas Wartzok* and G. Carleton Ray, The Johns Hopkins University, Baltimore, Md. 21205

We classified a total of 335 agonistic interactions during 467 minutes of observation of 31 groups of walrus totalling 393 animals. Twenty female/sub-adult groups averaged 0.00077 agonistic acts/animal/min. Four female/sub-adult groups, with animals entering the group, showed significantly higher rates of agonistic acts averaging 0.026/animal/min. Seven male groups displayed the highest rates, averaging 0.068 agonistic acts/animal/min. Strikes with the tusks comprised 20% of the agonistic acts in female/sub-adult groups, compared to 27% in male groups. Tusk feints comprised a significantly smaller percentage of agonistic acts (7%) in female/sub-adult groups than in male groups (19%). A circular tusk thrust was the only agonistic interaction in female/sub-adult groups in the Chukchi Sea which had not been previously reported for males during the summer in Bristol Bay.

2nd Conf. on Biology of Marine
Mammals, S. Diego, CA, 12-15 Dec.
1977, p. 78.

THERMOREGULATION OF HAULED-OUT WALRUS IN THE CHUKCHI SEA IN SUMMER. Douglas Wartzok* and G. Carleton Ray, The Johns Hopkins University, Baltimore, Md. 21205

We measured surface temperatures of walrus hauled out in air temperatures between 2.2 and 6.2°C, with corresponding black body temperatures of 3.9 and 16.0°C. Relative humidity varied from 78% to 92% and wind speed from 0 to 3.2 m/sec, 30 cm off the ice surface. Radiation thermometer temperatures of hauled-out walrus suggest that this range of microclimates is within the thermal neutral zone of the walrus. Body surface temperatures ranged from 16-30°C with rear flipper temperatures 2-8°C warmer than the rest of the body. An example of probable circulatory control for thermoregulation was one animal with a dorsal surface temperature of 23°C, rear flipper temperature of 30°C, and a belly temperature of 4°C. The belly had been in contact with the ice immediately before measurement.

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